

PROF. PFAUNDLER communicated in a recent session of the Vienna Academy the results of some experiments undertaken to decide the question as to the smallest absolute number of vibrations capable of producing a sound. By means of a siren with two openings for blowing, he finds that two isolated vibrations are capable of producing a tone which, by repetition, becomes audible.

THE Meteorological Society of Paris has elected as president M. Hervé Mangon, professor of Agriculture at the Conservatoire des Arts et Métiers.

THE Postal and Telegraph services are to be united in France, as they have been already in England, under a single direction. The first director of the complex organisation will be M. Cocheris, one of the staff of the *Temps* and a well-known writer on matters of political economy.

AT the last meeting, December 19, 1877, of the Russian Geographical Society, M. Mushketov made a very interesting communication on his last journey in the Tian Shan and to the Pamir, where he visited some places never before visited by European travellers. His researches enable us to correct many imperfections in the works of Gordon and Stoliczka, and to obtain many new and important data. A complete geological sketch of the Pamir highlands will soon be published by M. Mushketov. At the same meeting the secretary gave an account of a new expedition to Central Asia, which will start from St. Petersburg at the beginning of this year, under the leadership of Prof. A. E. Middendorff. The expedition has especially in view the study of the agricultural conditions of Turkistan, and the well-known traveller, zoologist, and practical agriculturist who is at the head of the expedition, will be supported in his work by MM. Smirnov and Russow.

AT the meeting, December 15, of the St. Petersburg Society of Naturalists Prof. Kessler referred to the fishes brought this year by M. Polyakoff from the lakes Ala-Kul and Balkhash. In addition to the seven species which were known before in the Central-Asian fauna he has discovered four new ones, one of which is the interesting fish described by the inhabitants as *Marenker* (its zoological description will soon appear), the flesh and caviare of which are poisonous.

PROF. BERTHELOT, of Paris, is probably the most prolific chemist of the day. We notice in the two last numbers of the *Annales de Chimie et de Physique*, the two last numbers of the *Comptes Rendus*, and the last *Bulletin de la Société Chimique de Paris*, thirty-two various articles under his name. Berthelot's researches are, however, confined to thermal and physical chemistry, and are not delayed by the analytical operations attendant on other branches of chemical investigation.

CAPT. J. O. LUNGINERS, of the Danish vessel *Lutterfeld*, communicates to a Copenhagen paper an interesting account of a novel experience which occurred on December 10, 1876, while on a voyage to Valparaiso. The vessel was at this time in the neighbourhood of Terra del Fuego, about 140 miles from Magellan's Straits, when early in the morning it narrowly escaped collision with an island where no trace of land appeared on the charts. The vessel hove-to until daylight, when the captain proceeded with a boat's crew to the new island, which had gradually diminished in size since the first observation. Around the conical rocky mass the water was hissing, and although no smoke appeared, it was found to be too highly heated to permit of landing. The [sinking continued slowly, until at eight o'clock the island was completely submerged, and an hour later the vessel passed over the spot where it had disappeared.

THE December Session of the Berlin Geographical Society

was occupied by a long and interesting address from Dr. F. M. Hildebrandt, on the results of his late African explorations. We have already alluded in a late number to the unfortunate result of the expedition to the snow-clad mountains of equatorial Africa, when the explorer was compelled to return with Mount Kenia fairly in sight. The heroism of Dr. Hildebrandt in battling with danger and disease in manifold forms is only approached by the adroitness and ingenuity which characterised his dealings with the natives. Among the Hataitas he was regarded as a magician, and was forced to pronounce incantations on the unfruitful fields. For this purpose, at his request, specimens of all the plants and animals in the vicinity were gathered by the tribe, and after having served as a "fetish," were carefully packed away in the collections. On another occasion he was attacked by several hundred natives, who beat a hasty retreat, when the explorer advanced towards them armed with a photographic camera. Despite the constant succession of misfortunes accompanying Dr. Hildebrandt during his two years' explorations in Africa, he has succeeded in gathering together a large and valuable collection of anthropological and botanical specimens especially, from Cape Gardafui and the Comoro island Johanna. A number of new species and genera, particularly of aromatic plants, were discovered in the former locality.

THE additions to the Zoological Society's Gardens during the past week include two Lions (*Felis leo*) from Upper Nubia, presented by Mr. John Baird; a Green Monkey (*Cercopithecus callitrichus*) from West Africa, presented by Mr. J. Scott; a Bonnet Monkey (*Macacus radiatus*) from India, presented by Mr. J. H. Thompson; a Common Thicknee (*Edicnemus crepitans*), European, presented by Mr. F. Möll; a Macaque Monkey (*Macacus cynomolgus*) from India, deposited; a Collared Fruit Bat (*Cynonycteris collaris*), a Geoffroy's Dove (*Peristera geoffroyi*), bred in the Gardens.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

OXFORD.—An examination for a Radcliffe Travelling Fellowship will be held on February 11. Candidates should forward notice of their intention to offer themselves, on or before January 15, to Dr. Acland.

An examination will be held at Queen's College on April 30 to fill up an open scholarship in natural science, of the value of 90*l.*, tenable for five years.

LONDON.—We learn that in consequence of the success attending the course of Lectures on Physiology now being delivered at the Working Men's College, Great Ormond Street, by Mr. T. Dunman, the Council of that Institution have arranged for the delivery, by the same gentleman, of a supplementary advanced course of about sixteen lectures, the first of which will be delivered on Friday, January 18. The lectures will be accompanied by practical demonstrations. Mr. Dunman has been appointed to the lectureship in physiology at the Birkbeck Institution, recently vacated by Dr. Aveling.

MANCHESTER.—MR. M. M. Pattison Muir, F.R.S.E., Assistant-Lecturer in Chemistry, and Demonstrator in the Laboratory of the Owens College, has been appointed Prælector in Chemistry at Gonville and Caius College, Cambridge.

BERLIN.—We notice in the report of a late session of the Prussian House of Deputies a very vigorous presentation, by Prof. Mommsen and Prof. Virchow, of the necessity for a new building for the royal library. This valuable collection of books—over 700,000 in number—is the largest in Germany, and increases so rapidly that the present quarters in the Imperial Palace are most inadequate. The Government shows an inclination to remedy the evil, and it is to be hoped that this chief store of mental pabulum for the Berlin student will soon be provided with a house of its own, and the much-needed catalogue of its treasures finally be published.

BUDAPESTH.—The committee intrusted with the preparations for the first centennial celebration of this university, have decided to invite all foreign universities to send representatives on the occasion. A work on the history of the university is being prepared by Prof. Theodor Pauler, the late Minister of Education.

HEIDELBERG.—In the recently-issued calendar of the University for the present semester we notice a serious falling off in the attendance, the present number of students (467) being 250 less than that for the past summer. This fact is chiefly due to the increasing custom of the German students to gather in the Universities of the great cities during the winter. The theological faculty includes 19 students, the medical, 79, the philosophical, 180, and the legal, 183. Heidelberg still possesses evidently its traditional attractions for English-speaking students, the catalogue containing the names of twenty-one Englishmen and twenty-six Americans, a large proportion of whom are studying under Bunsen. Of the sixty-seven other foreigners in attendance Switzerland contributes eighteen and Russia nineteen. The corps of professors numbers 105, of whom fifty-nine are in the philosophical faculty. Prof. Bluntschli, the leading authority on international law, is the pro-rector for the present year. We notice that Prof. Blum has been forced by advanced age to give up the chair of mineralogy. His connection with the University dates back to 1828, and under his direction the mineralogical department at Heidelberg has long been one of the favourite resorts of students from various countries, the museum ranking among the best in Europe. Prof. Blum's fame as a mineralogist rests chiefly on his thorough and exhaustive researches on pseudomorphs, the results of which are embodied in his work "*Die Pseudomorphosen des Mineralreiches*." A very complete and practical text-book of mineralogy, as well as the numerous smaller treatises on subdivisions of the science, which have appeared at intervals from his pen, are regarded as standard works.

STRASSBURG.—The grant of money for the new edifices of the university amounts to 10,500,000 marks (over 500,000*l.*). Of this sum 2½ millions are contributed from the imperial funds, 5½ millions result from Alsace-Lorraine's share of the new imperial bank notes, and the remainder is contributed by the city, the district, and the two provinces. At present the university is attended by 627 students divided as follows among the faculties;—theological, 49, legal, 156, medical, 117, philosophical, 305. Despite the able corps of professors gathered together since the re-establishment of this historic university, the number of students shows a decrease of eighty as compared with 1876, a result due in a great measure to the coldness exhibited by the old French inhabitants towards the German students.

HOLLAND.—The Netherlands School Museum, at Amsterdam, was opened on December 24, 1877, in presence of Mr. Heemskerk (recently Prime Minister of Holland), and several authorities connected with the Educational Department. Mr. A. van Otterloo, for the committee, in his opening speech alluded to the valuable co-operation of England in the exhibition. The authorities afterwards inspected the museum, and expressed their high appreciation of the interesting collections of school appliances exhibited by the School Board for London and others.

ST. PETERSBURG.—A new High School for ladies is to be opened at St. Petersburg for the special purpose of preparing female teachers for women's colleges. The School is provided with the necessary money by a young lady, and it will be conducted by the professors of the St. Petersburg University.

Prof. Tarkhanoff, of the St. Petersburg Medical Academy, having assisted at the examinations in physiology and anatomy of the thirty-six ladies who have now finished their five years' course at the High School of Medicine at St. Petersburg, publishes a report on those examinations. The answers of the ladies, he says, were definite, clear, and often vivid. Deep and very accurate knowledge was shown in anatomy and histology, the examinations having been made according to the extensive programmes existing in ordinary universities. On the average the answers were quite as good as those of male students; but the answers of three or four ladies, by their completeness and brilliancy, produced a deep impression on the examiners, and greatly exceeded all the professor has ever witnessed either as a student or professor.

CHARKOV.—The annual calendar of this Russian university shows an attendance of 442 students. Over half of this number are freed entirely from the payment of lectures, while a third receive annual stipends varying from 180 to 340 roubles. The corps of instructors numbers sixty-four.

SOCIETIES AND ACADEMIES

LONDON

Royal Astronomical Society, December 14, 1877.—Dr. Huggins, F.R.S., in the chair.—A paper by Dr. Wolf, of Zurich, set forth that the sun-spot period varies from seven to sixteen years, eleven years being the average.—A paper by Mr. C. V. Boys described a new astronomical clock. Mr. Christie and Lord Lindsay criticised it.—A photograph of the sun was presented by M. Janssen. It is one of those taken daily at Meudon, measuring one foot in diameter. Dr. De la Rue said it was the finest example of celestial photography he had ever seen. It was not taken with an equatorial, but an instrument after the fashion of the Kew photoheliograph with a 5½-inch object-glass. The picture was not taken at the principal focus, but in that of a secondary magnifier, corrected independently of visual focus. He pointed out the tornadoes visible on the photograph, and spoke of the importance of a physical observatory to register the changes which occur on a tremendous scale every hour, sun-spots being phenomena of comparatively small importance. Capt. Abney spoke in corroboration, and said that M. Janssen at first thought these photographed tornadoes had an atmospheric origin. Mr. Christie said that similar phenomena had been found on the Greenwich photographs, and they had nothing to do with the collodion.—Mr. Glaisher read a paper on the law of force tending to any point whatever in the plane of motion in order that the orbit may always be a conic.—Mr. Lynn gave a description of Mr. Howlett's drawing of the solar spot of October 31 to November 3, being about 15" diameter.—Lord Lindsay concluded the description of his spectroscope for nebulae referred to last month.—Mr. Christie made some remarks and criticised it, and the meeting then adjourned.

Photographic Society, December 11, 1877.—Papers were read by Capt. Abney, R.E., F.R.S., on fog-producing emulsions and their rectification, and by H. B. Berkeley, on emulsions. Capt. Abney showed that the cure, or rather the elimination, of fog in emulsions (as also in dry plates) would be effected by the introduction of either bromide, iodine, or nitric acid into the emulsion. Nitric acid prevented the formation of any chemically-produced sub-bromide of silver, and reduced the fog to the state of bromide; where pure bromide is present, it seems almost impossible that there should be fog. If an emulsion plate is exposed to light, and afterwards partly dipped into copper bromide, then exposed in the camera and developed, the portion treated with the bromide will be found to be free from fog and perfectly clear.

PARIS

Academy of Sciences, December 17, 1877.—M. Peligot in the chair.—The following papers were read:—On the order of appearance of the first vessels in the shoots of some Leguminosæ (third part), by M. Trécul.—Note on the ring of Saturn, by M. Tisserand.—On intramolecular work, by M. Boileau.—On an essential improvement of the navigation lock with mixed oscillation, by M. De Caligny.—M. Cailletet was elected correspondent for the section of mineralogy, in room of the late M. d'Ommalhus d'Alloy (obtaining thirty-three votes against nineteen for Mr. James Hales).—Production of crystallised sulphide, selenide, and telluride of silver, and of filiform silver, by M. Margottet. The former are obtained by passing vapours of sulphur, selenium, and tellurium, over silver (heated red) by means of a current of nitrogen.—The silver gets covered with the crystals. The crystallised sulphide is transformed into metallic and filiform silver by a current of dry hydrogen at 440 degrees. The corresponding reduction of the selenide and telluride takes place only at the highest temperatures the glass can bear.—Use of lacs of eosine and fluoresceine for preparation of decorative paintings without poison, by M. Turpin. A potassic or sodic solution of eosine, e.g., treated by an acid, gives a precipitate of eosic acid insoluble in water; this washed till the water begins to take a rose-colour is insoluble in the hydrate of oxide of zinc, and so forms a very rich lac (eosinate of zinc) varying from rose to deep-red, according to the quantity of eosic acid used.—Vine districts attacked by phylloxera (1877); by M. Duclaux. It is noted with reference to L'Aude that the vineyards bordering on the sea (some kilometres in width) are preserved much longer than the others.—The natural enemies of the phylloxera in Germany, by M. Blankenhorn. The small extension of centres of phylloxera there is attributed to the fact that the stocks have been frequented, previous to the phylloxera infection, by natural enemies of the